SPALLATION NEUTRON SOURCE
QUALITY INSTRUCTION

Inspection of Radiological Personnel Protective Equipment

Instruction Number: SNS-QA-i080

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Approval

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1 June, 2006 — Date

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Inspection of Radiological Personnel Protective Equipment

1 Purpose:

This instruction provides the specific attributes to be inspected and the associated acceptance criteria for Radiological Personnel Protective Equipment (PPE), or "Anti-Cs", that are procured as Commercial Items for Radiological Personnel Protection use at the Spallation Neutron Source (SNS) facility. It supplements procedure SNS-QA-P080, "Inspection and Acceptance Testing" and implements Criterion 8 of the SNS Quality Manual,

2 Scope

This instruction gives requirements for sampling and inspection of Radiological Personnel Protection Equipment including Lab Coats, Coveralls, Caps, Gloves, Booties, and Overshoes. This procedure does not include the inspection and acceptance of respiratory protection equipment that is performed under guidance of a dedicated ORNL program.

3 Responsibilities

- The SNS Radiological Protection staff shall evaluate the radiological hazards potentially present at the facility and determine the proper types of radiological personnel protective equipment necessary to perform operations and maintenance activities at the facility.
- The ORNL Radiological Protection Operations staff shall identify acceptable "brands" of Radiological PPE make such recommendations to procurement organization.
- The procurement organization shall procure Radiological PPE from established vendors based on supplier history and recommendations from the ORNL Radiological Protection Operations staff.
- The SNS Receiving Group shall receive the Radiological PPE and segregate the equipment for acceptance inspection before issuing it for use.
- Specifically trained inspection personnel shall inspect an appropriate sample of the received Radiological PPE using the Special Test and Inspection Specification Sheets of Appendix A-I of this instruction for acceptance of the lot.
- Inspection personnel shall contact SNS management and Radiological Protection Operations staff when there is a question of acceptability of an item or items.

4 Sampling

The intended purpose of Radiological PPE is first to protect the user from radiological contamination hazards and secondly to reduce the spread of that same contamination. The sampling program is therefore slightly more aggressive than that that would be used for less critical bulk items. Using the guidance provided in ANSI/ASQ-Z1.4-2003, the sampling plan is based around the recommendations of Table 1, General Inspection, Level III.

The lot size for a given purchase order is the quantity ordered for a given PPE item. The size of the PPE is not considered to be a distinguishing characteristic for purpose of this inspection. Material type or manufacturer is considered to be distinguishing characteristics. Similar items from different manufacturers or made from different materials should be considered separate lots.

The following sampling plan is designed to yield a minimum acceptance level of 97.5% of the sampled lot.

Lot Size	Sample Size	Max. Defects to Accept	Min. Defects to Reject
2 – 8	3	0	1
9 – 15	5	0	1

16 – 25	8	0	1
26 – 50	13	1	2
51 – 90	20	1	2
91 – 150	32	2	3
151 – 280	50	3	4
281 – 500	80	5	6

In the event that operational demands are such that the ordered radiological PPE is required to do perform critical activities, but the lot is rejected on the basis of the above sampling plan, those individual articles that have passed inspection may be placed into service. The remainder of the lot is still rejected.

5 Inspection of Equipment

When notified by receiving that an order of radiological PPE has been received, the inspectors will use the applicable Special Test and Inspection Specification Sheet (Appendix A- I) to inspect the sample of the received radiological PPE and document the results. If a situation occurs where the inspector is in doubt as to the acceptability of an item, a Radiological Protection Specialist should be consulted. The completed inspection specification sheet will be filed with the Purchase Order with a copy provided to Radiological Protection Operations for information.

6 References

SNS-QA-P080, Inspection and Acceptance Testing
SNS-QA-P01, SNS Quality Manual
SBMS Subject Area: Purchasing Supplies and Services
Guidance for Procurement and Acceptance Planning for Items intended for Nuclear Safety or Radiological Applications, Attachment 1
ANSI/ASQ-Z1.4-2003, Sampling Procedures and Tables for Inspection by Attributes
DOE O 414.1C, "Quality Assurance"
ISO 9001:2000 "Quality Management Systems-Requirements"

7 Appendices

Appendix A – Cloth Coveralls
Appendix B – Cloth Hoods
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Appendix D – Wet Work Coveralls
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Appendix G – Plastic Booties
Appendix H – Rubber Shoe Scuffs
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APPENDIX A

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Cloth Coveralls

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Weave Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on coverall.	White light should not be seen coming through the weave. If in doubt, sprinkle talc on material and check underneath.				
Material Integrity Examine the material for any snags or flaws. If found, conduct weave tightness test in area of snag or flaw.	Material should not have any snags or flaws that could let contamination through the material.				
Closure Tightness Operate closure device several times.	Closing device should seal properly and leave no gaps.				
Seam Fabrication Turn coverall inside out and examine all seams.	All seams are sewn tightly together. Both stitches should engage both pieces of material.				
Cuff Closures Check cuffs for sound attachment to sleeves and legs.	Cuffs should be securely attached to sleeves and legs without gaps.				
Pockets Check for sealing ability. Check for locating holes.	Pockets should seal without allowing for entrance of contamination. Holes are not allowed.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____

SNS Radiation Protection Group

APPENDIX B

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Cloth Hoods

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Weave Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on the hood.	White light should not be seen coming through the weave. If in doubt, sprinkle talc on material and check underneath.				
Material Integrity Examine the material for any snags or flaws. If found, conduct weave tightness test in area of snag or flaw.	Material should not have any snags or flaws that could let contamination through the material.				
Closure Tightness Operate closure device several times.	Closing device should seal properly and leave no gaps.				
Seam Fabrication Turn hood inside out and examine all seams.	All seams are sewn tightly together. Both stitches should engage both pieces of material.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____
SNS Radiation Protection Group

APPENDIX C

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Disposable Coveralls

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on coverall.	White light should not be seen coming through the material. If in doubt, sprinkle talc on material and check underneath.				
Material Integrity Examine the material for any snags or flaws. If found, conduct material tightness test in area of snag or flaw.	Material should not have any snags or flaws that could let contamination through the material.				
Closure Tightness Operate closure device several times.	Closing device should seal properly and leave no gaps.				
Seam Fabrication Turn coverall inside out and examine all seams.	All seams are sewn or bonded tightly together. If sewn, both stitches should engage both pieces of material.				
Cuff Closures Check cuffs for sound attachment to sleeves and legs.	Cuffs should be securely attached to sleeves and legs without gaps.				
Pockets Check for sealing ability. Check for locating holes.	Pockets should seal without allowing for entrance of contamination. Holes are not allowed.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____

SNS Radiation Protection Group

APPENDIX D

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Wet Work Coveralls

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on coverall.	White light should not be seen coming through the material. If in doubt, sprinkle water on material and check beneath.				
Material Integrity Examine the material for any snags or flaws	Material should not have any snags or flaws that could let contamination through the material.				
Closure Tightness Operate closure device several times.	Closing device should seal properly and leave no gaps.				
Seam Fabrication Turn coverall inside out and examine all seams.	All seams are bound tightly together.				
Cuff Closures Check cuffs for sound attachment to sleeves and legs.	Cuffs should be securely attached to sleeves and legs without gaps.				
Pockets Check for sealing ability. Check for locating holes.	Pockets should seal without allowing for entrance of contamination. Holes are not allowed.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____
SNS Radiation Protection Group

APPENDIX E

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Lab Coats

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Weave Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on coat.	White light should not be seen coming through the weave. If in doubt, sprinkle talc on material and check underneath.				
Material Integrity Examine the material for any snags or flaws. If found, conduct weave tightness test in area of snag or flaw.	Material should not have any snags or flaws that could let contamination through the material.				
Closure Tightness Operate closure device several times.	Closing device should seal properly and leave minimal gaps.				
Seam Fabrication Turn coat inside out and examine all seams.	All seams are sewn tightly together. Both stitches should engage both pieces of material.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____

SNS Radiation Protection Group

APPENDIX F

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Cloth Booties

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Weave Tightness Hold the material up to a light source and check for any sections of light passing through. Check in multiple locations on booties.	White light should not be seen coming through the weave. If in doubt, sprinkle talc on material and check underneath.				
Material Integrity Examine the material for any snags or flaws. If found, conduct weave tightness test in area of snag or flaw.	Material should not have any snags or flaws that could let contamination through the material.				
Seam Fabrication Turn booties inside out and examine all seams.	All seams are sewn tightly together. Both stitches should engage both pieces of material.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____
SNS Radiation Protection Group

APPENDIX G

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Plastic Booties

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Integrity Examine the material for any snags or flaws	Material should not have any snags or flaws that could let contamination through the material.				
Seam Fabrication Turn booties inside out and examine all seams.	All seams are bonded tightly together.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____
SNS Radiation Protection Group

APPENDIX H

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Rubber Shoe Scuffs

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Integrity Examine the material for any snags, rips, or flaws	Material should not have any snags, rips, or flaws that could let contamination through the material.				
Seam Fabrication Examine shoe scuff seams.	All seams are bonded tightly together.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____

SNS Radiation Protection Group

APPENDIX I

SPECIAL TEST AND INSPECTION SPECIFICATION SHEET
For
Radiological Personnel Protective Equipment – Rubber / Surgical Gloves

Requisition / PO #: _____ Item No.: _____ Number Received: _____

Critical Characteristic	Acceptance Criteria	Inspecting Organization	Sample Size	Sat / Unsat	Inspector's Initials & Date
Material Integrity Examine the glove for any holes, snags or flaws by inflating the glove like a balloon.	Material should not have any holes, snags or flaws that leak air when inflated. If in doubt, inflate the glove under water.				

Number Accepted: _____ Number Rejected: _____ NCR No.: _____

Results Reviewed and Appropriate Actions Taken: _____
SNS Radiation Protection Group